AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1.(Original) A method for encoding a plurality of bits, comprising:

based on a plurality of bits, selecting one of at least two mutually exclusive subsets of a signal constellation and a point within said selected subset; and

modulating the selected point using a carrier waveform,

wherein the selected subset includes at least two constellation points that are separated from one another by a distance based on a conditional distribution.

2.(Currently Amended) ~~The method of claim 1~~ A method for encoding a plurality of bits, comprising:

based on a plurality of bits, selecting one of at least two mutually exclusive subsets of a signal constellation and a point within said selected subset; and

modulating the selected point using a carrier waveform,

wherein the selected subset includes at least two constellation points that are separated from one another by ~~wherein the distance based on a conditional distribution is~~ one of a Kullback-Leibler distance and an expected Kullback-Leibler distance.

3.(Original) The method of claim 1, wherein selecting a subset of a signal constellation and a point within said selected subset comprises, based on a plurality $m=k_1+k_2$ of bits, using k_1 of the bits to select said subset and k_2 of the bits to select the point within said subset, wherein m, k_1 and k_2 are non-zero integers.

4.(Currently Amended) ~~The method of claim 3~~ A method for encoding a plurality of bits, comprising:

based on a plurality of bits, selecting, based on a plurality $m=k_1+k_2$ of bits, using k_1 of the bits to select one of at least two mutually exclusive subsets of a signal constellation and using k_2 of the bits to select a point within said selected subset, wherein m, k_1 and k_2 are non-zero integers; and

modulating the selected point using a carrier waveform,

wherein the selected subset includes at least two constellation points that are separated

from one another by a distance based on a conditional distribution, and

wherein using k_1 of the bits to select said subset comprises encoding the k_1 bits into n encoded bits, and selecting one of 2^n mutually exclusive subsets with the n encoded bits, wherein n is greater than k_1.

5.(Original) The method of claim 4 wherein $k_2=1$ and $n=k_1+1$.

6.(Original) The method of claim 5 wherein n is selected from the set consisting of three, four and five, wherein the k_1 bits are encoded using a 2/3 convolutional code when n=3, the k_1 bits are encoded using a 3/4 convolutional code when n=4, and the k_1 bits are encoded using a 4/5 convolutional code when n=5.

7.(Currently Amended) ~~The method of claim 1~~ A method for encoding a plurality of bits, comprising:

based on a plurality of bits, selecting one of at least two mutually exclusive subsets of a signal constellation and a point within said selected subset; and

modulating the selected point using a carrier waveform,

wherein the selected subset includes at least two constellation points that are separated from one another by a distance based on a conditional distribution, and

wherein the constellation points define concentric circles, and every point lying within a circle is from a different subset from every other point lying on that circle.

8.(Original) The method of claim 7 wherein every point on a circle is from a different subset from every other point lying on that circle and from every other point lying on an adjacent circle.

9.(Original) The method of claim 8 wherein n=3 and each subset defines two points.

10.(Original) The method of claim 1 further comprising transmitting the carrier, receiving the carrier over a fading channel, and decoding the symbol using a Viterbi algorithm.

11.(Original) A transmitter for transmitting a series of input bits comprising:

an encoder having an input for receiving a plurality of input bits;

a mapper having an input coupled to an output of the encoder; and

a computer-readable storage medium coupled to the mapper for storing at least one signal constellation,

wherein the mapper selects a subset of said signal constellation and a point within the selected subset based on the plurality of input bits, said selected subset including at least two constellation points that are separated from one another by a distance based on a conditional distribution.

12.(Currently Amended) ~~The transmitter of claim 11~~ A transmitter for transmitting a series of input bits comprising:

an encoder having an input for receiving a plurality of input bits;

a mapper having an input coupled to an output of the encoder; and

a computer-readable storage medium coupled to the mapper for storing at least one signal constellation,

wherein the mapper selects a subset of said signal constellation and a point within the selected subset based on the plurality of input bits, said selected subset including at least two constellation points that are separated from one another by ~~wherein the distance based on a conditional distribution is~~ one of a Kullback-Leibler distance and an expected Kullback-Leibler distance.

13.(Original) The transmitter of claim 11, wherein the plurality of input bits comprises $m=k_1+k_2$ of bits, of which k_1 of the bits are used to select said subset and k_2 of the bits are used to select the point within said subset, wherein m, k_1 and k_2 are non-zero integers.

14.(Currently Amended) ~~The transmitter of claim 13~~ A transmitter for transmitting a series of input bits comprising:

an encoder having an input for receiving a plurality of input bits;

a mapper having an input coupled to an output of the encoder for ; and

a computer-readable storage medium coupled to the mapper for storing at least one signal constellation,

wherein the mapper selects a subset of said signal constellation and a point within the selected subset based on the plurality of input bits, said selected subset including at least

two constellation points that are separated from one another by a distance based on a conditional distribution, and

wherein the encoder encodes k_1 of the bits into n encoded bits, and the mapper selects one of 2^n mutually exclusive subsets using the n encoded bits, wherein n is greater than k_1

15.(Original) The transmitter of claim 14 wherein $k_2=1$ and $n=k_1+1$.

16.(Original) The transmitter of claim 15 wherein n is selected from the set consisting of three, four and five, wherein the k_1 bits are encoded using a 2/3 convolutional code when n=3, the k_1 bits are encoded using a 3/4 convolutional code when n=4, and the k_1 bits are encoded using a 4/5 convolutional code when n=5.

17.(Currently Amended) ~~The transmitter of claim 11~~ A transmitter for transmitting a series of input bits comprising:

an encoder having an input for receiving a plurality of input bits;

a mapper having an input coupled to an output of the encoder; and

a computer-readable storage medium coupled to the mapper for storing at least one signal constellation,

wherein the mapper selects a subset of said signal constellation and a point within the selected subset based on the plurality of input bits, said selected subset including at least two constellation points that are separated from one another by a distance based on a conditional distribution, and

wherein the constellation points define concentric circles, and every point lying within a circle is from a different subset from every other point lying on that circle.

18.(Original) The transmitter of claim 17 wherein every point on a circle is from a different subset from every other point lying on that circle and from every other point lying on an adjacent circle.

19.(Original) The transmitter of claim 18 wherein n=3 and each subset defines two points.

20.(Original) The transmitter of claim 12 further comprising a receiver, said receiver said receiver using a Viterbi algorithm to decode a received symbol into a subset and a point within the subset according to the constellation.

21.(Original) A method for encoding a plurality of $m=k_1+k_2$ input bits comprising:

selecting a subset of a signal constellation based on the k_1 input bits;

selecting a point within the selected subset based on the k_2 input bits, wherein at least two points within the selected subset are spaced from one another by a distance based on a conditional distribution of at least one of said at least two points;

and

modulating the selected point using a carrier waveform,

wherein m, k_1 and k_2 are non-zero integers, and at least one of k_1 and k_2 are greater than one.

22.(Currently Amended) ~~The method of claim 21,~~ A method for encoding a plurality of $m=k_1+k_2$ input bits comprising:

selecting a subset of a signal constellation based on the k_1 input bits;

selecting a point within the selected subset based on the k_2 input bits, wherein at least two points within the selected subset are spaced from one another by a distance based on a conditional distribution of at least one of said at least two points; and

modulating the selected point using a carrier waveform,

wherein m, k_1 and k_2 are non-zero integers, and at least one of k_1 and k_2 are greater than one, and

wherein selecting a subset of a signal constellation based on the k_1 input bits comprises encoding the k_1 input bits into n encoded bits, and selecting one of 2^n subsets using the n encoded bits,

wherein n is an integer greater than k_1 that is derived from the k_1 bits and a previously input plurality of bits.

23.(Original) The method of claim 22, wherein each subset consists of two points and the signal constellation consists of 2^{m+1} points.